Abstract

Spring Tactics

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For our capstone, my partner and I reengineered a single player game we built into a multiplayer experience. At the start of the summer, it was only playable in single player with a rudimentary AI. In addition, the game also had no animation or audio which hurt the gameplay. Adding multiplayer and beautifying the game was done using Unity, Unity Netcode for Game Objects, Unity Relay, and Itch.io. My primary aim for this capstone project was the learning of new skills related to network design, graphical design, and testing methodologies.

One problem that I needed to overcome was connecting and synchronizing player data so that the game state was relayed accurately throughout the game. Another problem I needed to work out was designing a GUI that presented game information in a clear and concise manner. A third unexpected problem was developing balanced and visually appealing maps for players to experience.

To address the hurdle of connecting both players, our solution was to use Unity’s Netcode for Game Objects to transport data between players. Unity Relay allowed us to designate player one as a host in order to eliminate the need for a dedicated server. Unity Relay also allowed us to establish player connections without them having to configure settings themselves. To handle GUI issues, we utilized our own playtests and capstone group playtesting sessions to address issues concerning our design. To create entertaining maps, our approach involved referencing maps from other games in our genre. One issue that this presented was the asymmetric design of our reference maps which favored one side and made for poor game balance. Our solution to this was to split resources evenly and on a per map basis, ensuring that both spawns were positioned equitably. To further balance we tested and iterated on each map in multiple playtests.

This project achieved all objectives outlined in my contract. The current version of the project allows two players to connect and play each other online in a turn-based strategy game while maintaining a consistent game state. According to our play testers, the current maps are more balanced and visually interesting than our original maps. Finally, the game is published and available on Itch.io for anyone to play.

For my next steps I would consider reactivating our deprecated single player mode. Another step I’d consider would be working out some persistent multiplayer problems involving connecting and loading.